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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/336,363	06/17/1999	KOJI MATSUYAMA	FUJO16.216	7540

26304 7590 11/06/2008
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ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
11/06/2008	PAPER

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/336,363
Filing Date: June 17, 1999
Appellant(s): MATSUYAMA ET AL.

Dexter Chang
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed August 15, 2008 appealing from the Office action mailed August 7, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US pat. No.5768306	Sawahashi	6-1998

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 13,14,17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Sawahashi (US patent no. 5,768,306).

First consider claims 13, 17 and 18. The admitted prior art, depicted in Fig.1 and described "Description of the Related Art" of the present application shows a spread spectrum receiver/method that is used in a mobile station operating in a DS-CDMA communication system. The receiver performs a first correlation (1001) between a received signal and a pre-assigned spreading code (1012) and a second correlation (1005) between the received signal and a plurality of spreading codes (1006), based on the timing determined from the first correlation operation, page 8, line 18 – page 9, line 1. The admitted prior, though, fails to teach "a storage unit" for storing the received signal and "a control unit" using the stored signal for performing the first and second correlations.

Referring to Fig.4, Sawahashi et al discloses a sliding correlator used in a CDMA system for initial synchronization. A received signal is stored in a memory (43), col.6, lines 7-8, until a correct timing and PN sequence is identified. Specifically, the stored signal is read out from the memory at a rate higher than the chip rate under control of a control unit (41) and correlated with a pre-assigned spreading code. Col.6, lines 13-19. The phase of the spreading code is adjusted and correlated with the same received signal that is again read from the memory, until the correlation value exceeds a predetermined threshold. Col.6, lines 24-36. The storing of a received signal in a memory allows the same received signal to be repeatedly correlated with a spreading code, each time with a different phase, during one chip period so that a faster initial synchronization can be established. Col.6, lines 37-51. Furthermore, since the same spreading code would have been used for both the first and second correlations when the prior art

references are combined as proposed by examiner, it is only natural that the received signal must be stored in the storage unit, i.e., a memory, for a period of time at least until both correlation determinations have been performed.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to provide a storage unit, i.e., a memory, for storing the received signal in the prior art receiver and a control unit to read the received signal from the memory to correlators (1001 and 1005), which allows repeated correlation of the received signal with varying phases of a spreading code for the purpose of establishing a faster initial synchronization as taught by Sawahashi et al.

Regarding claim 14, all the subject matter identical to that of claim 13 has been discussed above, except for "determining which of the N (>2) spreading codes is attributable to the base station that has transmitted the received signal." Page 10, lines 17- 22 describes determining a spreading used by a base station if the correlation value exceeds a predetermined value. In other words, one of spreading codes stored in the timing code storage circuit (1011) is identified as the spreading code after one or more correlation operations.

(10) Response to Argument

A) Response to Issue 1: "Whether r not claims 13-14 and 17-18 are unpatentable under 35 U.S.C. § 103(a) for being obvious in view of AAPA and Sawahashi et al."

According to representative claim 13, two correlation operations are carried out.

During the first correlation operation, the received signal is correlated with a common spreading code by shifting the relative timing between the received signal and the common spreading code. The match filter (1001) illustrated in Fig.1 performs this function as described

in the Background of the Invention section of the specification. See page 6, lines 9-12 and page 8, lines 1-8. Specifically, according to the Background of the invention, the spreading code for the perch (or synch) channel may be the common to, i.e., the same for all the base stations. In that case same dispreading code with a varying timing is correlated with the received signal for synch detection. Therefore, AAPA clearly teaches the first correlation as defined in the claim.

Applicant cited Page 8, lines 8-13 of the specification to quote that "the timing code storage circuit 1011 stores the totaled values of correlation values for the number of candidates for the spreading codes of a perch channel." However, this description applies when there are multiple spreading codes for the perch channel, and thus is not relevant to the claimed invention. It follows that applicant allegation that AAPA cited by the Examiner already accounts for maintaining correlation values for different "candidates" for spreading codes inherent in each base station with the timing code storage circuit 1011 is not correct.

During the second correlation operation the same received signal is correlated with a plurality of spreading codes, which are different from the common spreading code used in the first correlation operation. The sliding correlators (1005) carry out this function as described in the Background section of the specification. Specifically, according to the Background of the invention section, the received signal is correlated with three spreading codes at the sliding correlations, which are unique to each base station, in response to the sync detection signal from the first correlation. See page 9, lines 12-18. Applicant correctly notes that three sliding correlators 1005-1 to 1005-3 for time-shifted correlation. And yet, there is no reason not to read the three time shifted versions of a spreading code as a plurality of spreading codes as defined in the claim. Therefore, AAPA also clearly teaches the second correlation as defined in the claim.

Thu, the only remaining question is the Sawahashi et al's teaching of a memory to store a received signal would have been obviously incorporated in the mobile station described in AAPA.

As correctly noted by Applicant, Sawahashi et al. describes a technique for establishing initial synchronization for a given spreading code sequence. Sawahashi et al describe a sliding correlator having a memory circuit 43 at its input stage for storing a received signal, from which the stored received signal is read from the memory circuit 43 at a frequency substantially higher than the storing rate of the received signal. Thus, a received signal may be correlated with different spreading codes (i.e., time shifted versions of a spreading code). With the use of a memory to store a received signal, Sawahashi et al clearly teaches the benefit of allowing a same signal to be correlated with different spreading codes a plurality of times.

Applicant explains that "Sawahashi describes the received signal being overwritten for each chip cycle (TC), and the received signal is, thus, stored for a period corresponding to one chip cycle (TC). Also, Sawahashi et al. describe reading out being performed K times on the basis of K/TC until the overwriting of the next received signal is performed, thereby the correlation is performed. This means that Sawahashi et al. describe the received signal being kept stored in the memory 43 during the period in which the correlation is obtained by multiplying the received signal with replica of the spread code sequence by shifting by one chip, and the overwriting after that is to be performed by the next received signal." However, this understanding of Sawahashi et al is incorrect. Sawahashi et al teaches the capacity of the memory at least sufficient enough to store one symbol period. See col.5:63-64 and col.6:57-63. One symbol period corresponds to m times chip period. See col.6:1-3. In other words, there is no overwriting of memory for each

chip period. Instead, the received signal is stored for one symbol period and a plurality of correlations, i.e., m correlations, are carried out, where each correlation last for one chip period. Since the received signal is stored at least for one symbol period in the Sawahashi et al patent, if the memory is used in the AAPA, it would have store the received signal over a time long enough to perform both the first and second correlation determinations of AAPA, as required by the claim.

(B) Response to Issue 2: "<u>The combination of AAPA and Sawahashi et al. would still have failed to disclose or suggest the claimed invention even assuming such a combination would have been obvious.</u>"

Applicant argues that Examiner employed improper hindsight in reading into the memory circuit 43 described in Sawahashi et al. a suggestion to store a received signal "over a time long enough to perform both the first correlation determination and the second correlation determination," by relying on an Exmainer's statement in the Advisory action of November 29, 2007, where the Examiner conceded that Sawahashi et al. discloses storing the received signal during a first correlation period only (Advisory action; page 2, lines 5-8). However, the Examiner clearly added that Sawahashi et al. was only relied upon for the feature of storing the received signal while it is being correlated with a predetermined spreading code (Advisory action; page 2, lines 11-13). If Sawahashi et al taught storing the received signal during a first correlation period and a second correlation period, the patent would have been a prior art reference anticipating the claimed invention under 35 USC 102. It appears that applicant demands that the features of the secondary reference, i.e., the teachings of memory for storing a

received signal in the Sawahashi patent, be bodily incorporated into the structure of the primary reference, i.e., AAPA. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Since Sawahashi et al clearly teaches that a stored signal can be stored for at least one symbol period in order to correlate it with spreading codes repeatedly for fast initial synchronization, this teaching would have been obviously adopted when a received signal is to be repeatedly correlated with one or more spreading codes. Since the received signal of AAPA has to be correlated first with a common spreading code and next with a base station specific spreading code repeatedly, the memory used by Sawahashi et al would have been obviously employed to store the received signal until both correlation operations have been completed.

(11) Related Proceeding(s) Appendix

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Kevin Y Kim/

Primary Examiner @ AU 2611

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/Shuwang Liu/

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Supervisory Patent Examiner, Art Unit 2611